#### Low Back Pain-Osteopathic Family Medicine Pearls

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#### Acknowledgements

 Many thanks to Nicole Peña DO (chairwoman) and Touro faculty OMM department Touro University College of Osteopathic Medicine 1310 Club drive Vallejo, CA

#### **Presentation Objectives**

- At the conclusion of the presentation, learners will be able to:
- Recognize and locate common areas of Somatic Dysfunction that cause low back pain
- Utilize multiple Osteopathic Manipulative Treatments (OMT) for common disorders such as lumbago and its connection to hip & knee pain, psoas & piriformis syndrome and sciatica.
- Feel more comfortable using their hands as a treatment tool to assist their patients healing process
- Utilize their Osteopathic skills to understand better when to use physical medicine (OMT, PT and/or Acupuncture) and when to obtain imaging and/or surgical consultation

#### Low Back Pain Review

- Epidemiology
- 4 Tenets of Osteopathy
- LBP Causes and Symptoms
- LBP Research
- Differential Diagnoses
- Osteopathic Considerations
- Cases / Anatomy
- RedFlags
- Treatment

#### Incidence

- Low back pain is now the leading cause of disability worldwide.
- Disabling low back pain is over-represented among people with low
- socioeconomic status.
  Only a small proportion of people have a well understood pathological cause-eg, a vertebral fracture, malignancy, or infection
- Most people with new episodes of low back pain recover quickly; however, recurrence is common and in a small proportion of people, low back pain becomes persistent and disabling.
- Lancet . 2018 Jun 9;391(10137):2356-2367. What low back pain is and why we need to pay attention .lan Harbidran et al.

#### Incidence

- Global Prevalence: According to the Global Burden of Disease Study, LBP is the leading cause of disability globally.
- Lifetime Prevalence: Studies suggest that approximately 60-70% of people will experience LBP at some point in their lives.
  Annual Incidence: 15% of adults experience low back pain in any given year.
- Occupational Factors: heavy lifting, prolonged sitting, or repetitive movements-->higher rates of LBP
- Age: most prevalent in adults aged 30 to 60 years old, highest incidence between ages 35 and 55.
- Gender: slightly higher prevalence in women, particularly during childbearing years.
   Socioeconomic Status: lower socioeconomic status
- Chronic vs. Acute: many cases of low back pain resolve within a few weeks, a significant portion can become chronic, leading to long-term disability and reduced quality of life.

#### **Epidemiology & Descriptors**

- LBP has a lifetime prevalence of 60-85%
- Low back pain (LBP) is defined as pain localized between the 12th rib and the inferior gluteal folds, with or without leg pain
- · Most cases are non-specific
- LBP is often associated with other pain manifestations such as headache, abdominal pain and pain in different locations of the extremities
- Widespread pain is associated with a worse prognosis compared to localized LBP

Common Family Medicine complaint: Low back pain

- Osteopathic physicians are equipped to add more to our office visit because we apply the 4 tenets of Osteopathy:
- \*The body is a unit
- \*Structure and function are interrelated
- \*The body has its own innate ability to heal itself
- \*Rational approach applies to all three of the above

#### Low Back Pain Causes and Symptoms

- Muscle strain/spasm (Psoas>>Piriformis>QL)
- Poor posture
- Mental /Emotional stress
- Osteoarthritis
- Spinal stenosis
- Bulging/Herniated disk (w &w/o fragmentation)
- Pinched nerve
- Tumors
- other health conditions (Meningitis, RA, Cancer etc)

#### Low Back Pain Causes and Symptoms cont'd

- Headache- Tailbone trauma
- Stiffness/Mobility limitations in your Lower back and hips
- Numbness or tingling (pins and needles) feeling in your legs/feet
- Sciatica-Tailbone trauma
- Pain trying to straighten up
- Muscle Spasms- Psoas Spasm



#### Low Back Pain Research

- Avoiding rest and [Performing] manual therapy can reduce pain and maintain and restore function in acute LBP
- Behavioral treatment can prevent LBP from becoming chronic
- Aerobic fitness and endurance training, behavioral treatment and multi-disciplinary treatment programs can reduce pain and can improve/maintain function in chronic LBP.
- Best Pract Res Clin Rheumatol. 2007 Feb;21(1):77-91. Strategies for prevention and management of musculoskeletal conditions. Low back pain (non-specific), M Krismer et al

#### LBP Research cont'd

- **Background:** In China, the world's largest developing country, low back pain (LBP) is a common public health issue affecting workability.
- Results: Meta-analysis-involving 86,575 people (15 studies)
- Seven risk factors for LBP were identified. Six risk factors were statistically significant: Cigarette smoking, body mass index (BMI)  $\ge 28$  kg/m<sup>2</sup>, female sex, vibration exposure at work, working overtime, and lack of exercise.
- Ing periods
   BMC Public Health . 2024 Apr 26;24(1):1181. Risk factors for low back pain in the Chinese population: a
   systematic review and meta-analysis

#### LBP Research cont'd-

- A systematic review of MT (manual therapy) with a literature search covering the period of January 2000 to April 2013 was conducted by two independent reviewers according to Cochrane and PRISMA guidelines. A total of 360 studies were evaluated using qualitative criteria.
- Two stages of LBP were categorized; combined acute-subacute and chronic.
- · Acute-subacute LBP: STRONG-evidence in favour of MT1 (manipulation) when compared to sham for pain, function and health improvements in the short-term (1-3 months) J Man Manip Ther. 2014 May;22(2):59-74. The efficacy of manual therapy and exercise for different stages of non-specific low back pain: an update of systematic reviews, Benjamin Hidalgoetal

#### LBP Research cont'd

- MODERATE-evidence to support MT1 and MT3 (MT1 plus MT2) combined with UMC (usual medical care) in comparison to UMC alone for pain, function and health improvements in the short-term.
- Chronic LBP: MODERATE to STRONG-evidence in favour of MT1 in comparison to sham for pain, function and overall-health in the shortterm.
- · MODERATE-evidence in favour of MT3 combined with exercise or UMC in comparison to exercise and back-school was established for pain, function and quality-of-life in the short and long-term.
- · LIMITED-evidence in favour of MT2 (mobilization and soft-tissuetechniques) combined with exercise and UMC in comparison to UMC alone for pain and function from short to long-term.

#### LBP Research cont'd

\*Systematic review aimed to summarize: (1) the prevalence and incidence of CLBP in older adults, and (2) demographic, psychological, and clinical factors positively/negatively associated with prevalence/incidence of CLBP among older adults.

\*Ten studies (31.080 older adults) were included

#### \*No prognostic factor was identified

J Pain. 2022 Apr;23(4):509-534. Prevalence, Incidence, and Factors Associated With Non-Specific Chronic Low Back Pain in Community-Dwelling Older Adults Aged 60 Years and Older: A Systematic Review and Meter Acted in the Specific Development of the State St

#### No prognostic factor was identified

- Gender
- Obesity
- Anxiety, Depression, Mental disorders,
- Self-expectation of recovery,
- Self-perceived health status,
- Lifestyle (smoking, daily fluoride consumption),
- Previous falls or lower body injury,
- Retirement/disability due to ill health,
- Family history of body pain,
- Comorbidity (knee osteoarthritis, or chronic obstructive pulmonary disease with/without hypertension),

#### No prognostic factor was identified cont'd-

- · Weak abdominal muscles,
- Leg pain,
- Leg pain intensity,
- Widespread pain,
- Pain interference on functioning,
- Use of pain medication,
- Occupational exposure (driving for >20 years, or jobs involving bending/twisting for >10 years),
- · Disc space narrowing and severe facet osteoarthritis

#### LBP Research cont'd

• However, very limited evidence suggested that intermediate level of leisure-time physical activity was associated with a lower prevalence of CLBP in older adults

#### LBP Research cont'd-

- Patients with low back and neck pain are most likely to be treated with OMT, and osteopathic manipulative medicine specialty physicians and family medicine physicians most often use OMT.
- However, many osteopathic physicians report using OMT infrequently.
- ....limited evidence on its efficacy in treating chronic pain. The **lone** exception involves chronic low back pain, wherein there is evidence from systematic reviews, a large clinical trial, and observational studies.
- J Pain Res. 2020 Jul 20:13:1839-1847. Osteopathic Manipulation in the Management of Chronic Pain: Current Perspectives, John C Licciardone, et al

#### LBP Research Cont'd

- Given the philosophy of osteopathic medicine, universal training of osteopathic physicians to use OMT, and national guidelines supporting non-pharmacological treatments for chronic pain, it is unclear why OMT use is reported to be remarkably low in physician surveys.
- Why do you use it?
- Why do you not use it?
- Of all the research on MM- LBP has the best evidence

#### Differential Diagnoses-Spinal Diagnoses

- Spondylolithesis (slippage of one vertebral body over another)
- Spondylosis (AS, degeneration of the vert. column)
- Spondylolysis (Common sports injury, sm. crack btwn 2 vert)
- Lumbar facet syndromes (Arthritis...)
- Infectious (Osteomyelitis and Septic Discitis)
- Osteoarthritis (DDD, DJD)
- Cancer (The red flag with the highest post-test probability for detection of spinal malignancy was history of malignancy)

#### Lumbar spondylolysis

Background-Lumbar spondylolysis (LS) is a common sport injury. Severe LS is likely to cause spinal instability, resulting in lumbar spondylolisthesis or lumbar disc herniation, and even damage to the spinal nerve roots. The incidence of LS is approximately 5% in the adult population, and nearly half of young athletes with LBP are diagnosed with LS. This meta-analysis analyzed the incidence of LS in athletes with LBP.

Conclusions- The estimated prevalence of LS in athletes with LBP is 41.7%, and future correlations between the prevalence of LS in adolescent athletes worldwide need to be assessed from different perspectives, including biomechanical, hormonal, anatomical, behavioral, and gender differences.

Medicine (Baltimore). 2023 Sep 22;102(38):e34857. Incidence of lumbar spondylolysis in athletes with low back pain: A systematic evaluation and single-arm meta-analysis. Jingvuan Li, et al



#### Most Common Osteopathic Considerations

- Sacral Shear or Unilateral Sacral Extensions (Common reason for knee pain) w/ or w/o Pubic Shear, w/ or w/o Short leg
- Psoas Spasm Syndrome
- Piriformis Syndrome
- Gluteus Min/Med Spasm
- Quadratus Lumborum Spasm
- With Associated Lumbar SD (Non-Neutral-Type 2) and/or lesser common lesions...

#### Less Common Osteopathic Considerations

- Upslipped innominate
- Non-physiologic Sacral Torsions- (R on L and L on R)
- Anterior and Posterior Innominate

#### Failed Low Back Pain- Greenman

#### ns (2,206 unread)

- Dirty Half Dozen
  - short leg
  - non neutral lumbar mechanics
  - pubic dysfunction
  - innominate shears
  - sacral extension
  - muscle imbalance







#### Case #1

- 65 yo man with 15 yr hx/o having right sided knee pain with negative X-rays (other than some OA). No injuries other than, "Fell on tailbone while skiing 15 + yrs prior".
- "have not been able to ski ever since knee started hurting some months after the fall"
- Findings- (L) Sacral Shear, (R) Psoas spasm
- OMT using Direct (HVLA) to SS and Counter-strain with ME assist to Psoas.
- Results- After one treatment- Knee Pain gone, began skiing again for another 10 years



"I think I slept funny."

#### Case #2

- 62 yo male presents with ongoing LBP
- Seen by a local Osteopathic physician who only does OMT
- Despite many treatments over a year, LBP persists, along with some radicular symptoms.
- Pain is described as irritating and hurts worse after sitting for long periods

#### Case #2- What would you do?

- Trial of OMT, because..."Hey, I am way better than that DO!"??
- Obtain an Xray and or MRI if indicated?

#### Case #2- Xray and MRI

- Degenerative changes no overt L/S disc disease
- Now what?
- Trial of OMT?...because "Hey, I am way better than that DO!"??

#### Case #2- Physical Examination and Labs

- PE grossly within normal limits, except
- Borderline Grade 2 prostate without nodules

#### PSA

- Elevated at >25
- Alkaline phosphatase elevated (+BB fraction)
- Patient has Prostate cancer (PCA)

#### Case #2 – Teachable Moment

- Remember Cancer when working up LBP
- PCA -->incidence goes up every decade for men
- PCA is the second leading cause of death-->U.S. men.
- Endorectal Coil MRI of great assistance in diagnosing- Life (Basel).2022 Apr
- Metformin- Aging Male. 2023 Dec:28(1):2156407. Risk analysis of metformin use in prostate cancer: a national population-based study Jung XLip
   (Inversely associated with PCA risk)
- Invasion of the Prostate Snatchers: An Essential Guide to Managing Prostate Cancer for Patients and their Families-Mark Scholz, MD

MARK SCHOLZ, MD & RALPH H. BLUM 12 **Cancer for Patients and Their Families** 



#### Case #3

- 45 yo male with Acute on Chronic LBP, getting worse over the past month to the point that he could not get out of a chair without assistance.
- Describes the pain, "A basketball sized area encompassing entire"
- Osteopathic evaluation reveals Left Sacral Shear, right psoas spasm treated with OMT....with minimal relief
- Patient relates that the feels pain is 8-9/10 and is localized to lower back---> Xray is WNL
- What would you do Doctor??

#### Case #3 Cont'd

- Emergent MRI and labs ordered
- ESR 40
- Bandemia of 21
- WBC 3.1
- · 'Questionable discitis, with no definite fluid pocket'

#### Case #3 cont'd

- Patient sent emergently to Cal Pacific Med Center, for NeuroRad
- NeuroRads and Neurosurgeon review MRI and tell the patient to go home and to take pain medicine (Tylenol and Motrin), "The pain is from a mild form of Degenerative disc disease", "Discitis was an over-read"
- Instead, the patient went back to the local hospital, as he describes he felt that he was "on the verge of dying"
- What would you do??

#### Case #3 Cont'd

- Local Orthopedist placed a PICC line and started IV Rocephin and Vanco, "You cannot fake a bandemia"
- Within 24 hours the pain had reduced by 50%
- Within 72 hours the bandemia started to normalize and the pain was gone.
- ABX for another 2 months.
- · Complete recovery.

#### Case #3 cont'd Teachable Moments

- If you listen to the patient long enough, they will tell you the answer
- This patient knew he was dying, and would have



Only 3 important things to know

# Anatomy, Anatomy, Anatomy...

A.T. Still, MD, DO





#### Lumbar Spine Degenerative Disc Disease



#### Facets

- Note how the facets allow for:
- Forward Bending
- Backward Bending
- Side to side
- Yet limited rotation
- Reason for the Sacral Somatic Dysfunctions









### **SCIATICA**

can be caused by the compression or irritation of nerve L4, L5, S1, S2 and S3. The sciatica symptoms depend on which nerve is compressed or irritated.























## Anatomical Attachments throughout the body matter

- "If your buns are not on right, your head is not on right" Richard Koss, DO
- Always be mindful of sacral Somatic Dysfunction in your History and Physical Examination for Low Back Pain, especially if they have HA that started soon after (fell on tail bone...)

#### LBP Red Flags

- 3 clinical entities-->Emergency Department for prompt Neurosurgical management.
- 1) Hyperalgesic Sciatica (not helped by meds)
- 2) Sciatica with motor deficits (Paralytic legs asso)
- 3) Cauda Equina Syndrome

Note- Sciatica with sensory deficits do not require Emergency Department referral.

#### Other LBP Red Flags

- Vertebral fracture (older age, prolonged use of corticosteroids, trauma, contusion or abrasion)
- Cancer/Matignancy-The red flag with the highest post-test probability for detection of spinal malignancy was history of malignancy)
- Infection- especially when there is associated systemic illness
- In general, the absence of red flag responses did not meaningfully decrease the likelihood of a red flag diagnosis; 64% of patients with spinal malignancy had no associated red flags.
- While a positive response to a red flag question may indicate the presence of serious disease, a negative response to 1 or 2 red flag questions does not meaningfully decrease the likelihood of a red flag diagnosis. Clinicians should use caution when utilizing red flag questions as screening tools.

#### Other LBP Red Flags

• Pars interarticularis are the most common identifiable problems





#### Pars interarticularis

• Black arrow demonstrates normal pars interarticularis. The white arrow demonstrates lucency in the pars interarticularis, suggestive of fracture. The scottie dog features: transverse process being the nose, the pedicle forming the eye, the inferior articular facet being the front leg, the superior articular facet representing the ear, the pars interarticularis equivalent to the neck of the dog. The "collar" represents the pars fracture.

#### TREATMENT

- Physical Medicine- Osteopathic Manual Medicine, PT, NMT etc...
- Nutriceuticals/Pharmaceuticals
- Exercise/ Self Care
- Interventional Medicine (Blocks, Surgery etc...)

#### Manual therapy plus targeted brain reeducation and behavior modification

- Materials and Methods: Sixty adults with CNLBP were randomly divided into three equal groups (each n = 20). The first group received manual therapy and PNE (Pain Neuroscience Education) with integrated MI (combined therapy group), the second group underwent only manual therapy (manual therapy group), and the third group tollowed a general exercise program at home (control group).
- **Results:** Statistically significant differences between the intervention groups and the control group were found in both the fourth-week measurement and the six-month follow-up, as evident in the NPRS and RMDQ scores, as well as in the total values of tested PPTs
- Conclusions: The addition of PNE with integrated MI enhanced the positive effects of a manual therapy intervention in all outcome measures. The combination of manual therapy plus PNE with integrated MI appeared to provide greater improvements compared to the isolated application of manual therap and these improvements also lasted longer. rapy,
- Medicina (Kaunas): 2024 Mar 29;60(4):556. Effects of Manual Therapy Plus Pain Neuroscience Education with Integrated Motivational Interviewing in Individuals with Chronic Non-Specific Low Back Pain: A Randomized Clinical Trial Study. Kanataethican Kauling Value V

#### MAPK /ERK signaling pathway-IDD and IVD

- Mitogen-activated protein kinase (MAPK)/extracellular signal-regulated kinase (ERK) signaling pathway is closely related to various pathological processes in IDD,
- The activation of the MAPK/ERK pathway promotes the degradation of the IVD extracellular matrix, cell aging, apoptosis, and inflammatory responses.
- · Induces autophagy and oxidative stress that accelerate the IVD process.
- Summarize the latest developments in the negative regulation of IDD after activation of the MAPK/ERK signaling pathway and emphasize on its influence on IDD.
- Targeting this pathway may become an attractive treatment strategy for IDD in the near future.
- Biomed Pharmacother. 2021 Nov: 143: 112170. MAPK /ERK signaling pathway: A potential target for the treatment of intervertebral disc degeneration. Hai-Jun Zhang <sup>etal</sup>



#### Interventions-Curcumin (Tumeric)

- Mol Med Rep. 2018 Aug;18(2):1433-1438. Curcumin suppresses cardiac fibroblasts activities by regulating the proliferation and cell cycle via the inhibition of the p38 MAPK/ERK signaling pathway. <u>Guanhua Fang <sup>etal</sup></u>
   J Chem Neuroant. 2024 Apr:137:102402. Curcumin abrogates cobalt-induced neuroinflammation by suppressing proinflammatory cytokines release, inhibiting microgliosis and modulation of ERK/MAPK signaling pathway. <u>Bathway. Bathway. Bathway. Etal</u>
- Bioorg Chem. 2023 Mar: 132: 106358. Discovery of β-cyclocitral-derived mono-carbonyl curcumin analogs as anti-hepatocellular carcinoma agents via suppression of MAPK signaling pathway. Haoyi Han, etal
- J Cell Mol Med. 2021 Aug;25(15):7190-7203. Curcumin inhibits adverse psychological stress-induced proliferation and invasion of glioma cells via down-regulating the ERK/MAPK pathway. Ping Wang, etal
- Pharm Biol. 2016 Aug;54(8):1303-11. Curcumin induces apoptosis and suppresses invasion through MAPK and MMP signaling in human monocytic leukemia SHI-1 cells. Guo-Hua Zhu, etal

#### Shea Nut Extract

- PLoS One. 2019 Apr 19;14(4):e0215812. Oral shea nut oil triterpene concentrate supplement ameliorates pain and histological assessment of articular cartilage deterioration in an ACLT injured rat knee osteoarthritis model. Ing-Jung Chen stat-...may be an effective management strategy for symptom relief and cartilage protection in patients with both acute and chronic OA.
- Nutrients. 2020 Mar 30;12(4):957. Shea Nut Oil Extracts Enhance the Intra-Articular Sodium Hyaluronate Effectiveness on Surgically Induced OA Progression in Rats. Ing-Jung Chen, etal---Shea nut oil extract (SNO) was shown to provide chondroprotection on surgically-induced OA progression in rats.

#### Boswellia serrata extract

• Pilot study of 48 pts with knee OA

- BSE also significantly reduced the serum levels of high-sensitive C-reactive protein, a
  potential inflammatory marker associated with OA of the knee.
- Radiographic assessments showed improved knee joint gap and reduced osteophytes (spur) confirming the efficacy of BSE treatment.
   Eindings provide not the biologically setting constituents of BSE pamely AKPBA and
- Findings provide evidence that biologically active constituents of BSE, namely, AKBBA and BBA, act synergistically to exert anti-inflammatory/anti-arthritic activity showing improvement in physical and functional ability and reducing the pain and stiffness.

 Phytother Res. 2019 May;33(5):1457-1468. A pilot, randomized, double-blind, placebo-controlled trial to assess the safety and efficacy of a novel Boswellia serrata extract in the management of osteoarthritis of the knee. <u>Muhammed Maleed</u> and

#### Boswellia- cont'd

- 545 study participants were included in the meta-analysis.
- From these participants, researchers were able to conclude that Boswellia could be both effective and safe in treating osteoarthritis. Boswellia was found to relieve pain associated with osteoarthritis while also improving function in affected joints. It was noted in the analysis that using at least 100 to 250 milligrams (mg) of Boswellia for at least four weeks was best.
- Yu G, Xiang W, Zhang T, Zeng L, Yang K, Li J. Effectiveness of Boswellia and Boswellia extract for osteoarthritis patients: a systematic review and meta-analysis. BMC Complement Med Ther. 2020;20(1):225. doi:10.1186/s12906-020-02985-6



Looking After Your Back.

#### Osteopathic Treatment Modalities for LBP

- HVLA
- Muscle Energy
- Soft Tissue- Kneading & stretching and Inhibition
- Myofascial Release
- Jones Strain-Counter-strain
- Cranial Osteopathy
- Balanced Ligamentous Tension (LAR)
- Facilitated Positional Release & Still Technique

#### **Treatment Considerations**

- Osteopathic Evaluation points to Somatic Dysfunction(s)--> OMT along with stretching, behavior modifying (stress reduction/ nutrition etc..), & Nutriceuticals / Pharmaceuticals, NMT, and PT as indicated)
- If OMT (+) x 3 is performed and patient is not 50-80% better-->
- Add Acupuncture
- No better after 3 OMT visits +/- Acup--> Imaging
- If Worse or No improvement or 'better, than reoccurs after minutes to hours' after OMT x 1-3 --> Imaging and referral to Neurosurgical / Ortho, Prolotherapy / PRP etc....

#### Treatment – Self Guided Stretching Exercises

- Side to side (x2)
- Bird Dog
- Plank (Straight arm or bent at elbow)
- Bridges
- Hamstring Stretches
- Piriformis/Psoas Stretches
- Cat/Cow (High, Mid and Low)
- Childs Pose (modified)

## Which muscles are most responsible for Low Back Pain?

Jai Warner • Nov 12, 2019

You may have heard lots about the "core" muscles being super important when trying to reduce back pain. That's true, but only to a certain extent.

While the abdominal muscles are important, research and clinical experience indicates that there are four main muscles which appear to have the greatest role in back pain beginning in the first place.

The most common muscles that are responsible for Low Back Pain are the Iliopsoas, Quadratus Lumborum, the Gluteals and the Multifidus muscles. They are the muscles that attach in and around your spine.

#### lliopsoas Muscle - the hidden prankster

The Iliopsoas is actually two muscles that meet at the front of your hip. The psoas major attaches into the bottom vertebrae of your back – but they attach at the front of them. The other muscle, the iliacus, attaches on the inside of your pelvis, and runs downwards. Amazingly, when there are issues with these muscles – such as a sprain or active trigger points, it is very common for them to refer pain into the lower back. What it feels like is that the pain is very deep – so deep that no amount of poking or prodding can find it.

We can tell you right now -if you have "tried everything" for your back pain and nothing has worked so far, and these muscles hasn't been properly assessed or treated properly, then it must be checked - it is highly likely to be involved.

#### Quadratus Lumborum - The side bender

This muscle connects your rib cage to your pelvis – and is most responsible for bending you from side to side. When you have an issue with this muscle, it causes pain that feels like there could be something wrong with your kidneys, and it will be difficult to straighten up, feeling like you are leaning to one side. This can often tighten up in conjunction with psoas as above.

#### Gluteal Muscles - the main movers of your hips

Everyone knows where the glutes are – they are your buttocks. There are actually three layers of gluteal muscles – and an assessment on how you stand, bend and walk can establish which of them are causing the most trouble.

In terms of pain, the gluteal muscles are usually involved when the pain is around your belt line, and radiates outwards toward the side of your hips. The gluteal muscles are also very commonly the cause of sciatic nerve-like pain... in fact, it is extremely common that sciatica is misdiagnosed as a problem with a nerve root, when it is actually tightness in the gluteal muscles that is causing the issue.

Your core, or trunk, includes your:

- Erector spinae: The erector spinae is a group of three back muscles that extend up your trunk. It helps you stand up straight after bending over, as well as bend sideways and rotate your head.
- Rectus abdominis: When you bend forward, you use an abdominal muscle called the rectus abdominis. It's sometimes called the "six pack" muscle.
- Obliques: Your internal oblique and external oblique help you rotate or bend your trunk.
- Transverse abdominis: The transverse abdominis, which wraps around the front and side of your trunk, stabilizes your pelvis.
- Multifidus: The multifidus in your back supports your spine.

#### The Multifidus muscles - the deep protectors of your spine

A lot has been made of the core muscles, especially the abdominals. The abdominals, however, are like a sling that wraps around your internal organs, and don't attach directly into your spine.

The multifidus muscles are more important when it comes to lower back pain. In fact this group of muscles are the deepest layer of muscles, and like iliopsoas, attach directly into the spinal column – into the back of the vertebrae. There are stacks of research in the last 20 years which show that the integrity of these muscles are paramount, and are one of the biggest predictors of whether back pain will progress.

They cause back locally in the spine, and require strengthening to return to full function.

By undertaking the most thorough assessments, using objective measurements, our MedX Lumbar Extension Machine and other recognised clinical tests, we are able to diagnose if the muscles are the main causes of your pain issue, and begin addressing them. This gives us the best possible chance to reduce your pain, and get you back to doing the things you want to do.

We offer a vast variety of different treatment methods to rehabilitate muscles - you can find out more about them here.

Other muscles that make up your core include your:

- pelvic floor
- diaphragm
- glutes
- muscles that attach to the pelvis (hamstrings, hip flexors, and hip adductors)

Keeping these muscles strong helps stabilize your body, support your spine, and enhance your overall fitness.





This pose activates your glutes to lift your hips, which helps train your core while toning your butt and thighs.



#### Plank

The plank is a full-body exercise that targets your core. It also strengthens your arms, shoulders, back, glutes, and legs.



#### ыга род

The bird dog engages both your abdominal and back muscles, so it's an ideal corestrengthening move. It also challenges your coordination, balance, and stability.





#### LOW BACK PAIN REVIEWED

- Epidemiology
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#### Lumbar Spine Muscle Energy (This technique is usually utilized to treat segments L1 through L5): This is an example of treating L4 FRR

#### Physician Position: Stands facing the patient

Patient Position: Lateral recumbent position on the side of the posterior transverse process (right side down in this case)

- 1) Begin by obtaining consent from your patient.
- Make an accurate diagnosis
   The patient is then asked to fully abduct their right arm in a manner such as would you bring their right arm up near their head such that your ear is resting on it.
- 4) The physician palpates between the spinous processes of L4 and L5 at the L4 facets. (see fig. 6) 5) The physician flexes both the patient's knees and hips until L5 is flexed to the barrier (note that for an
  - extended dysfunction, this segment below the dysfunctional segment would be fully flexed). a. If possible, palpate the facets opening and closing. In this instance, the L4 facets should be
    - opened and then attempt to close. They cannot close as the left is locked open.
    - b. If you cannot palpate the facet motion, put the segment below into full flexion (L5 here) for flexed segments and the dysfunctional segment for extended segments.
- 6) The physician positions the patient's left leg so that the left foot is tucked in the popliteal fossa of the patient's right leg. And the left knee is dropped over the side of the table cephalad to the right knee. The patient's knee is supported by the physician's leg or legs.

- 7) The patient's right leg is extended, being careful to maintain positioning at the flexion or extension barrier.
- 8) The physician maintains this barrier position with their right forearm placed between the patient's left femoral trochanter and gluteal muscles. The physician rotates the pelvis anteriorly and superiorly to induce rotation to L5 and sidebending to L4.
- 9) While continuing to palpate L4 the physician places the left forearm in the patient's left axilla. The rotation barrier is localized now both from above and below. Through the shoulder from above (rotating L4 to the left) and through the hip from below (rotating L5 in this case, to meet the tension created by rotating L4 to its barrier from above and thereby fixing L4 at its rotational barrier).
- 10) The patient is then instructed to attempt to rotate their pelvis posterior, while the physician provides an unyielding counter force.
- 11) This isometric contraction is held for three to five seconds.
- 12) And then the patient is told to stop and relax for 1-2 seconds.
- 13) Only after the patient has fully relaxed. This process will be repeated until the dysfunction is resolved or no further change is made, typically three to five times.
- 14) With the barriers still localized in all three planes, a final localized stretches performed toward and through the barrier if possible.
- 15) Then the patient is passively returned to neutral and this segment is reassessed.

Of note, this technique may also be applied for type I somatic dysfunctions. In that case, only the side bending and rotational component would be engaged while leaving the dysfunctional segment in neutral. In order to achieve this, the following changes are made to the above procedure:

- 1. The patient's arm would be tucked (adducted) under the their shoulder instead of raised overhead in order to induce sidebending in the other direction.
- 2. The segment being treated is neither flexed nor extended but neutral
- 3. The forearm contact on the pelvis moves the pelvis both anteriorly and inferiorly and the patient's engagement is posterior and superior instead of posterior and inferior.





